CONTENTS

Number 1

S. CHRISTENSEN & J. M. TIEDJE. Brief and vigorous N_2O production by soil at spring thaw 1

J. MARTINEZ & G. GUIRAUD. A lysimeter study of the effects of a ryegrass catch crop, during a winter wheat/maize rotation, on nitrate leaching and on the following crop 5

R. G. JOERGENSEN & B. MEYER. Chemical change in organic matter decomposing in and on a forest rendzina under beech (*Fagus sylvatica* L.) 17

M. V. CHESHIRE, B. T. CHRISTENSEN & L. H. SØRENSEN. Labelled and native sugars in particle-size fractions from soils incubated with ^{14}C straw for 6 to 18 years 29

L. M. CONDRON, E. FROSSARD, H. TIESSEN, R. H. NEWMAN & J. W. B. STEWART. Chemical nature of organic phosphorus in cultivated and uncultivated soils under different environmental conditions 41

G. ALMENDROS & J. A. LEAL. An evaluation of some oxidative degradation methods of humic substances applied to carbohydrate-derived humic-like polymers 51

M. BERDÉN & D. BERGGREN. Gel filtration chromatography of humic substances in soil solutions using HPLC-determination of the molecular weight distribution 61

R. J. HAYNES & R. S. SWIFT. Stability of soil aggregates in relation to organic constituents and soil water content 73

A. HADAS. Directional strength in aggregates as affected by aggregate volume and by a wet/dry cycle 85

C. D. GRANT, A. R. DEXTER & C. HUANG. Roughness of soil fracture surfaces as a measure of soil microstructure 95

G. D. BUCHAN & K. S. GREWAL. The power-function model for the soil moisture characteristic 111

H. BILINSKI, L. HORVÁTH, N. INGRI & S. SJÖBERG. Aluminosilicate phases during initial clay formation: H^+–Al^{3+}–oxalic acid–silicic acid–Na^+ system 119

M. F. BILLETT, F. PARKER-JERVIS, E. A. FITZPATRICK & M. S. CRESSER. Forest soil chemical changes between 1949/50 and 1987 133

M. CONYERS. The control of aluminium solubility in some acidic Australian soils 147

R. NAIDU, J. K. SYERS, R. W. TILLMAN & J. H. KIRKMAN. Effect of liming and added phosphate on charge characteristics of acid soils 157

R. NAIDU, J. K. SYERS, R. W. TILLMAN & J. H. KIRKMAN. Effect of liming on phosphate sorption by acid soils 165

Number 2

H. Gvirtzman, M. Magaritz & A. Nadler. Dual water flow pattern in the unsaturated zone under a gypsum-amended soil 177

D. R. Scotter, L. K. Heng, D. J. Horne & R. E. White. A simplified analysis of soil water flow to a mole drain 189

A. J. A. Vinten & M. H. Redman. Calibration and validation of a model of non-interactive solute leaching in a clay–loam arable soil 199

P. S. Blackwell, A. J. Ringrose-Voase, N. S. Jayawardane, K. A. Olsson, D. C. McKenzie & W. K. Mason. The use of air-filled porosity and intrinsic permeability to air to characterize structure of macropore space and saturated hydraulic conductivity of clay soils 215

I. Messing & N. J. Jarvis. Seasonal variation in field-saturated hydraulic conductivity in two swelling clay soils in Sweden 229

H. A. Elwell. The development, calibration and field testing of a soil loss and a runoff model derived from a small-scale physical simulation of the erosion environment on arable land in Zimbabwe 239

W. A. Adams, A. Y. Ali & P. J. Lewis. Release of cationic aluminium from acidic soils into drainage water and relationships with land use 255

I. C. Grieve. Soil and soil solution chemical composition at three sites within the Loch Dee catchment, SW Scotland 269

R. G. Joergensen & B. Meyer. Nutrient changes in decomposing beech left litter assessed using a solution flux approach 279

D. Curtin & J. K. Syers. Mechanism of sulphate adsorption by two tropical soils 295

D. Curtin & J. K. Syers. Extractability and adsorption of sulphate in soils 305

M. T. García-González & F. J. Aragoneses. Paragonite in Spanish 'raña' soils 313

S. Hughes & B. Reynolds. Evaluation of porous ceramic cups for monitoring soil-water aluminium in acid soils: comment on a paper by Raulund-Rasmussen (1989) 325

Book Reviews 329

List of Referees in 1989 339

Number 3

A. G. Bengough & C. E. Mullins. Mechanical impedance to root growth: a review of experimental techniques and root growth responses 341

U. Lundström & L-O. Öhman. Dissolution of feldspars in the presence of natural organic solutes 359

M. Krosshavn, J. O. Bjørgum, J. Krane & E. Steinnes. Chemical structure of terrestrial humus materials formed from different vegetation characterized by solid-state ^{13}C NMR with CP–MAS techniques 371

H. Kirchmann. Nitrogen interactions and crop uptake from fresh and composted ^{15}N-labelled poultry manure 379

D. C. Whitehead & N. Raistrick. Ammonia volatilization from five nitrogen compounds used as fertilizers following surface application to soils 387

A. R. Ahmad & P. H. Nye. Coupled diffusion and oxidation of ferrous iron in soils. I. Kinetics of oxygenation of ferrous iron in soil suspension 395

G. J. D. Kirk, A. R. Ahmad & P. H. Nye. Coupled diffusion and oxidation of ferrous iron in soils. II. A model of the diffusion and reaction of O_2, Fe^{2+}, H^+ and HCO_3^- in soils and a sensitivity analysis of the model 411

D. Curtin & J. K. Syers. Influence of nitrate and chloride on the adsorption and transport of sulphate in soils 433

O. K. Borggaard, S. S. Jørgensen, J. P. Møberg & B. Raben-Lange. Influence of organic matter on phosphate adsorption by aluminium and iron oxides in sandy soils 443

G. M. Laslett & A. B. McBratney. Estimation and implications of instrumental drift, random measurement error and nugget variance of soil attributes—a case study for soil pH 451

M. Voltz & R. Webster. A comparison of kriging, cubic splines and classification for predicting soil properties from sample information 473

A. Bruand. Improved prediction of water-retention properties of clayey soils by pedological stratification 491

A. J. Ringrose-Voase. One-dimensional image analysis of soil structure. I. Principles 499

A. J. Ringrose-Voase & C. Nys. One-dimensional image analysis of soil structure. II. Interpretation of parameters with respect to four forest soil profiles 513

L. A. Sullivan. Soil organic matter, air encapsulation and water-stable aggregation 529

Number 4

S. C. Brown & D. Payne. Frost action in clay soils. I. A temperature-step and equilibrate differential scanning calorimeter technique for unfrozen water content determinations below 0°C 535

S. C. Brown & D. Payne. Frost action in clay soils. II. Ice and water location and suction of unfrozen water in clays below 0°C 547

A. Fortun, J. Benayas & C. Fortun. The effects of fulvic and humic acids on soil aggregation: a micromorphological study 563

E. Tipping & C. Woof. Humic substances in acid organic soils: modelling their release to the soil solution in terms of humic charge 573

J. Balesdent, A. Mariotti & D. Boisgontier. Effect of tillage on soil organic carbon mineralization estimated from ^{13}C abundance in maize fields 587

J. S. Robinson & J. K. Syers. A critical evaluation of the factors influencing the dissolution of Gafsa phosphate rock 597

M. T. Pardo & M. E. Guadalix. Phosphate sorption in allophanic soils and release of sulphate, silicate and hydroxyl 607

The following five papers were presented at a British–Israeli Symposium on 'Transport Processes in the Soil' at Rothamsted Experimental Station, September 1989

J. D. Cooper, C. M. K. Gardner & N. MacKenzie. Soil controls on recharge to aquifers 613

T. Galin, C. McDowell & B. Yaron. The effect of volatilization on the mass flow of a non-aqueous pollutant liquid mixture in an inert porous medium: experiments with kerosene 631

S. Staunton. A comparison of the surface impedance factors of Ca, Na, Rb and Cs derived from their self-diffusion coefficients in various soils 643

M. T. F. Wong, R. Hughes & D. L. Rowell. Retarded leaching of nitrate in acid soils from the tropics: measurement of the effective anion exchange capacity 655

E. G. Youngs & P. B. Leeds-Harrison. Aspects of transport processes in aggregated soils 665

Letter to the Editor 677

Book Reviews 679